GT Smart Cities and Inclusive Innovation Framework
All communities can be smart

• How to translate to other governments and geographies?

• What are known solutions and new challenges at different scales and jurisdictions?

• How to bridge the various socio-economic gaps, disparities, and discrepancies?
City-University Partnership
The Georgia Smart Communities Challenge is a first-of-its-kind grand challenge for communities of any size in the state of Georgia to receive funding and support to empower their smart future.

- To spur smart community development throughout GA
- To position GA as a smart community leader
Projects

**Chatham County**
City of Savannah, Creative Coast

- Improve flood warnings, emergency response action plans, flood predictions for future flood events

**City of Albany**
Dougherty County, DCA, Initiative for Community Housing, Fight Albany Blight

- Test a pilot sensor network for seal level flood risk during natural disasters
  - Kim Cobb, School of Earth & Atmospheric Science

**Gwinnett County**
GDOT, Cities of Berkeley Lake, Duluth, Norcross, Suwanee

- Evaluate traffic management technologies for improved vehicle mobility
  - Anshuman Guin, School of Civil and Environmental Engineering

**City of Chamblee**
City of Doraville, MARTA, Assembly CID, Stantec

- Study mobility improvements using AVs which travel from MARTA stations into the community
  - Ellen Dunham-Jones, School of Architecture

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Midterm Progress Reports

- Projects underway with active research and stakeholder engagement
- Innovative ways to use technology and data to advance goals
- Local and national attention
- Opportunities for additional research and funding
Challenge projects are the seed
GA Smart Community Playbook

- Best practices and learnings distilled from all four communities
- Accessible to all GA Communities and beyond
Georgia Smart Community Corps

Smart technology and data can shape and improve the communities around us. Are you compelled to use your Georgia Tech education for public service? The Smart Community Corps may be for you!

- Paid full-time summer fellowship for undergraduate or graduate students
- Create livable, equitable communities through smart tech and data implementation

smartcities.ipat.gatech.edu/georgia-smart-community-corps
2019 GA Smart Communities Challenge
Enhanced Partnership:

1. Similar Programming
   - GT funded research

2. ARC Livable Centers Initiative
   - Communities submit proposals directly to ARC
   - Mobility and Equity

3. GA Smart w/ Georgia Power Funded Grants
   - Open to all of Georgia
   - Smart Resilience
March 29th Community Growth Workshop

8:30am- Welcome and Introductions

10:30am-12:15pm- Community Presentation/Panel
- Chatham County
- City of Chamblee
- City of Albany
- Gwinnett County
- Economic and Community Development Team, GA Power (Moderator)

9:00am – 10:15am- Key Panel- How smart cities foster community growth?

12:30- 1:15pm- Lunch

1:15pm- 4pm- Dual Tracks for Workshop
- Track 1- GA Smart Communities on Data
- Track 2- GA Communities-

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Outreach and Impact

5 webinars

25+ speaking events

2000+ subscriber network

40+ national and local news articles
Programming

7 events with over 60 speakers and 500+ attendees

Upcoming:
29 March- Community Growth Workshop
17 April- Gwinnett Site Visit
23 April- Indian Smart Cities
9 May- Omar Issac Asensio Webinar
16 May- Savannah Site Visit
June- Winner Announcement

Chamblee Mayor Eric Clarkson @ GA Smart Workshop
“I am particularly thrilled about staff working with their GT research partner to help us challenge the status quo, make bold recommendations, experience and adapt technology. Together, using a smart risk approach, we can implement a traffic system which is at the cutting edge of what is possible with recent scientific advances.”

Charlotte Nash, Gwinnett County Board of Commissioners Chairman
**Timeline**

- **JAN ‘19**
  - [15th] ARC LCI w/ GA Smart Proposals Open
  - [5th] Onsite @ Chamblee

- **FEB**
  - Smart Community Corps and Civic Data Science (Mid- May- August)

- **MAR**
  - [7th] Webinar #3 Prof. Guin Gwinnett Co.
  - [29th] GA Smart Spring Workshop @ GT

- **APR**
  - LCI w/ GA Smart Proposals Due
  - [17th] Onsite @ Gwinnett Co.

- **MAY**
  - [9th] Webinar #4 Prof. Asensio Albany
  - [16th] Onsite @ Savannah
  - ‘19 GA Smart Proposals Due

- **JUN**
  - ‘19 Challenge Winners Announced
  - ‘18 GA Smart Projects End
  - ‘19 GA Smart Projects Start

- **JUL**
  - [5th] GA Smart Fall Workshop @ GT

- **AUG**

- **SEP**

---

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Smart Community Initiatives

GPA Spring Conference
March 27, 2019
Agenda

• Background
  • Gwinnett County
  • Connected Vehicles (CV)
  • Georgia Connected Vehicles Activities

• Gwinnett Connected Vehicle Technology Master Plan

• Five Year Plan

• Smart Corridor Deployment
- 726 Traffic Signals
- Over 550 communicate with TCC
- Over 230 miles of fiber optic cable
- More than 260 CCTV cameras
- Over 220 flashing beacon locations
- Continued Expansion of Advanced Traffic Management System
School Zone Beacon Upgrade

• 1st Smart Community project for GCDOT
• Current system installed in 2016
• Procured by a request for proposal process
  • Upgraded to two-way communications equipment
  • Moved to a cloud based software solution
What is so special about a Connected Vehicle?

“Connected Vehicles Can Sense and Communicate Things Drivers Cannot”
- US DOT
- GDOT has already deployed roadside units (RSU) on SR 141 and SR 8
- Planning to expand along RTOP corridors
- North Avenue Smart Corridor – City of Atlanta
- Local Agency Initiatives
Connected Vehicle Technology Master Plan
Connected Vehicle Technology Master Plan - Goals

• Provide Gwinnett County guidance with deploying CV technology to improve safety for all road users.

• Establish recommendations of standards and best practices for CV technology

• Have measurable outcomes for CV projects

• Be replicable for both Gwinnett County and other local governments
Connected Vehicle Technology Master Plan – Team Members

- **GCDOT**
  - Tom Sever – Project Champion
  - Ken Keena
  - Alex Hofelich

- **Georgia Tech**
  - Dr. Angshuman Guin – Research Lead

- **AECOM**
  - Marc Start – Project Manager
  - Suzanne Murtha – Industry Expert
  - Leslie Langley

Last, But Certainly not Least…

- Stakeholders
Stakeholder Meeting – November 2018

- Public Safety Departments
- Transit
- Cities and Community Improvement Districts (CID)
- GDOT

Focus areas identified by stakeholders

<table>
<thead>
<tr>
<th>Focus Area</th>
<th>Comment Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congestion relief</td>
<td>12</td>
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<tr>
<td>Emergency vehicles</td>
<td>8</td>
</tr>
<tr>
<td>Pedestrian safety</td>
<td>8</td>
</tr>
<tr>
<td>Transit buses</td>
<td>3</td>
</tr>
<tr>
<td>Bottleneck alerts</td>
<td>3</td>
</tr>
<tr>
<td>Freight</td>
<td>3</td>
</tr>
<tr>
<td>Incident response and clearance times</td>
<td>3</td>
</tr>
</tbody>
</table>
Five-Year Plan
Deployment Framework (in progress)

**2019 - 2020**
- **Smart Corridor** (gen 1)

**2021 - 2022**
- **Test and Evaluate** Smart Corridor with GDOT, ARC, others

**2023 - 2024**
- **Scale** up to county extents (gen 2)

**Beyond....**
- **Continued Evaluation and Application Maturity**
### 5 Year Plan Details (in progress)

<table>
<thead>
<tr>
<th>Application / Year</th>
<th>2019 - 2020</th>
<th>2021 - 2022</th>
<th>2023 - 2024</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gwinnett County PIB Smart Corridor</td>
<td>Develop and Test New Applications; In Coordination with ARC, GDOT</td>
<td>Scale Up to County-Wide, and Fine-Tune Applications</td>
</tr>
<tr>
<td>1. All Solutions</td>
<td>• Deploy DSRC in the West Zone</td>
<td>• State-wide; dashboard for intersection traffic signal operations (RR + EVP + TSP + FSP transition times)</td>
<td>• Deploy DSRC county-wide</td>
</tr>
<tr>
<td></td>
<td>• Test connected vehicle data collection, analytics, and archiving</td>
<td>• State-wide; manage RR + EVP + TSP + FSP conditional requirements</td>
<td>• County-wide connected vehicle data, analytics, and archiving</td>
</tr>
<tr>
<td></td>
<td>• Test CV-generated safety data alerts</td>
<td>• Test CV-generated safety data alerts</td>
<td>• Deploy mission-critical CV-generated safety data alerts</td>
</tr>
<tr>
<td>2. Signal Phase and Timing (SPaT) Information</td>
<td>• Enable red light warning, phase termination/next signal phase, and green band speed applications</td>
<td>• Monitor benefits of safety applications related to fleet penetration of DSRC and cellular OBUs</td>
<td>• Monitor benefits of safety applications related to fleet penetration of DSRC/cellular OBUs</td>
</tr>
<tr>
<td>3. Emergency Vehicle Preemption (EVP)</td>
<td>• Enable EVP</td>
<td>• State-wide; manage EVP conditional priority requirements</td>
<td>• Alerts for excessive transition time</td>
</tr>
<tr>
<td></td>
<td>• Install OBUs on fire trucks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Transit Signal Priority (TSP)</td>
<td>• Enable TSP</td>
<td>• Manage TSP conditional priority</td>
<td>• County-wide system development</td>
</tr>
<tr>
<td></td>
<td>• Install OBUs on transit vehicles</td>
<td>• Test schedule adherence conditional priority</td>
<td>• Alerts for excessive transition time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Test bus occupancy conditional priority</td>
<td></td>
</tr>
<tr>
<td>5. Freight Signal Priority (FSP)</td>
<td>• Enable FSP</td>
<td>• State-wide; manage FSP conditional priority</td>
<td>• County-wide system development</td>
</tr>
<tr>
<td></td>
<td>• State-wide; manage FSP conditional priority</td>
<td>• Develop commercial freight outreach program</td>
<td>• Alerts for excessive transition time</td>
</tr>
<tr>
<td></td>
<td>• Develop additional railroad crossing safety applications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Construction and Maintenance Vehicle Alert</td>
<td>• Enable alerts</td>
<td>• State-wide; manage alert conditional requirements</td>
<td>• County-wide system development</td>
</tr>
<tr>
<td></td>
<td>• Install OBUs and HMIs on select GCDOT vehicles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Rail Intersection Blocked Alert</td>
<td>• Enable predictive railroad crossing delay</td>
<td>• State-wide; evaluate railroad crossing safety applications</td>
<td>• County-wide system development</td>
</tr>
<tr>
<td></td>
<td>• Railroad crossing prediction accuracy</td>
<td></td>
<td>• Develop additional railroad crossing safety applications</td>
</tr>
<tr>
<td>8. Mobile Accessible Pedestrian Signal System (PED-SIG)</td>
<td>• Driver alerts based on pedestrian pushbutton activation</td>
<td>• Test transit and school bus door open events</td>
<td>• County-wide system development</td>
</tr>
<tr>
<td></td>
<td>• Test applications for the visually impaired</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>• Test applications for mid-block pedestrians</td>
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</tr>
</tbody>
</table>
Master Plan Next Steps

March 29
• Georgia Smart Communities Workshop @ Georgia Tech

Wednesday, April 17
• Georgia Smart and Gwinnett County hosting Regional CV Conversation

March – April
• Circle back with industry

April - August
• Engage in Public information and Education

May – July
• Draft Study Documentation
Smart Corridor Deployment
Smart Corridor Overview *(draft)*

- $2.6M deployment
- Design Build RFP
- Completion in early 2020
- 150+ signalized intersections
- Leverage existing infrastructure & CV applications
- Innovation solution component
Smart Corridor Applications (draft)

- Emergency vehicle priority
- Transit signal priority
- Pedestrian presence notification
- Railroad crossing status
- Construction and maintenance activity notification
- Signal timing and phasing information

Photo Credits
https://www.its.dot.gov
Questions?

Tom Sever, P.E.
Deputy Director, Traffic Engineering, Operations and Maintenance
tom.sever@gwinnettcounyt.com
City of Chamblee
Shared Autonomous Shuttle

Smart Communities Challenge
Agenda

1. Phase I
2. Phase II Project Scope
3. Route Analysis
4. Extended Route
5. Vehicle Secure Storage
6. Operations
7. Deployment / Next Steps
1. Phase I
Phase I

Feasibility Study:
- Description of technology
- Chamblee analysis
- Cost estimates
- Route alternatives
- Recommendations
- Next steps

Peachtree Road Streetscape:
- Road diet
- Safety and operational improvements
<table>
<thead>
<tr>
<th>Comparative Analysis</th>
<th>City Civic Complex</th>
<th>PDK Airport</th>
<th>Peachtree Station</th>
<th>Chamblee Plaza</th>
<th>Keswick Park</th>
<th>Third Rail/Assembly</th>
<th>CDC/IRS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of residents along route</td>
<td>= = =</td>
<td>= = =</td>
<td>=</td>
<td>= = =</td>
<td>= =</td>
<td>=</td>
<td>=</td>
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<tr>
<td>Number of jobs along route</td>
<td>= = =</td>
<td>= =</td>
<td>= = =</td>
<td>= =</td>
<td>= =</td>
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<tr>
<td>Number of trips per hour with 2 vehicles</td>
<td>= =</td>
<td>= = =</td>
<td>= = =</td>
<td>= = =</td>
<td>= = =</td>
<td>= = =</td>
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<tr>
<td>Compatibility with low speed shuttle</td>
<td>= = =</td>
<td>= = =</td>
<td>= = =</td>
<td>= =</td>
<td>= = =</td>
<td>= = =</td>
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<tr>
<td>Increase in transit service coverage</td>
<td>= = =</td>
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</tbody>
</table>

**Legend**
- OK
- Good
- Great
2. Phase II – Project Scope
Project Scope – Research

Best Practices Manual:

• Study of how the prevalence of autonomous vehicles will alter user preferences (mode choice, commute distance, parking ratios) that will eventually impact land use patterns.

• Research into the user experience at existing and proposed SAV installations.

• Design of the mobility hub adjacent to the MARTA station.

• Proposals for retrofitting existing parking lots and garages to park fully autonomous fleets or for more intense redevelopment.
Project Scope – City

Operations Plan:
• Project description and schedule
• Charging/Storage/Maintenance plan
• Routing and signage/signalization criteria
• Technology provider(s) and operations team and responsibilities
• Use case scenarios
• Testing and evaluation plan
• Funding (if applicable) and procurement of system/services
• Risk assessment and mitigation strategies
• Emergency response plan
• Licensing requirements
• Cost estimates
3. Route Analysis
Route Analysis

1. Core Route (streetscaped)
   - McGaw to Broad St
   - Segments defined by stop locations (segments 1-5)
Southern Terminus (Peachtree Station)

- Turnaround at McGaw Drive 3-Way Stop
Intermediate Stops

1. Mercy Care

2. MARTA (Chamblee Station)

3. Entertainment District (Chamblee Dunwoody Way)
Northern Terminus (Broad Street)

- Turnaround in pergola / parking lot area
- Flashing Beacon Stop Signs & Warning Signage
Chamblee Tucker Intersection

- Required: Connected Intersection
SAV Stops

Requirements:
1. ADA concrete landing pad
2. Sidewalk connectivity
3. Signage

Recommendations:
4. Passenger amenities
5. Road painting

Optional:
6. Interactive map
4. Extension Route
Third Rail / Assembly

1. Extended Route (Existing Conditions)
   - North of Broad St (segments 6 and 7)
   - Provides meaningful connection to major employers
   - Impacts SAV service profiles
Route Analysis

• Operating conditions vary from core route
5. Vehicle Secure Storage
Vehicle Secure Storage

Minimum Standards:

• Secure
• Dimension: 10’ x 10’ x 10’
• Tool / Supply Storage
• Power: Type 1 Charging Station or NEMA 14-50R outlet (recommended)
• Washing Capabilities
Potential Facilities

Preferred:
1. Chamblee Police Station

Other options:
2. Chamblee Village / Olmstead Parking Garages
3. Third Rail / Assembly Yards
6. Operations
4. Operations

Peachtree Station - Assembly
Length = 2.2 miles

10 hour service day / 7 days / week

Single SAV (no spare) = 15-minute headway
4. Operations

Service Profile

- Commuter / Last Mile Service

In-Service: 5am to 10am
Charge: 10am to 3pm
In-Service: 3pm to 8pm

4 AM 6 AM 8 AM 10 AM 12 PM 2 PM 4 PM 6 PM 8 PM 10 PM
Service Profile

• Leisure / Entertainment Service
Service Profile

- Hybrid Service
### 4. Operations

#### Estimated Cost to Implement

<table>
<thead>
<tr>
<th>Infrastructure Improvements</th>
<th>Capital Expenditures</th>
<th>Annual Operating Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>$75,000 - $100,000</td>
<td>$10,000 - $35,000 (monthly lease)</td>
<td>$250,000 - $350,000</td>
</tr>
<tr>
<td>Connected infrastructure</td>
<td>$250,000 - $425,000 (own)</td>
<td>$250,000 - $350,000</td>
</tr>
<tr>
<td>Flashing beacon stop signs</td>
<td>Vehicle</td>
<td>$250,000 - $350,000</td>
</tr>
<tr>
<td>Benches</td>
<td>Start up training &amp; programming</td>
<td></td>
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<tr>
<td>Sidewalk connectivity</td>
<td></td>
<td></td>
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<tr>
<td>Lane painting / signage</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td><strong>Software licensing</strong></td>
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<td></td>
<td><strong>Insurance</strong></td>
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<td></td>
<td><strong>Maintenance</strong></td>
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<td></td>
<td><strong>Onboard attendant</strong></td>
<td></td>
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<tr>
<td></td>
<td><strong>Program management</strong></td>
<td></td>
</tr>
</tbody>
</table>
7. Deployment / Next Steps
Next Steps

1. Stakeholder Buy-In: Support & Funding
2. Vehicle Vendor Evaluation: Determine which vehicle to purchase (2 months)
3. Manufacturer’s Site Review (1-3 weeks)
4. Manufacture Vehicle & Import (2-8 weeks)
5. Route Programming & Testing (1-2 weeks)
6. Operator Training (1 week)
7. Service Launch
Could Self-Driving Shuttles be Coming to Chamblee?

Published: August 7, 2022

Imagine tapping an app on your phone and just a few minutes later, a car shows up to take you whenever you want to go at an affordable price.

Okay, that's a stretch. You can already do that.

Now imagine that the vehicle pulling up to your curbs has no driver. The city of Chamblee, along with several partners, is preparing for just that.

Chamblee is one of four cities across Georgia to win a grant from Georgia Tech's Smart Communities Challenge. Chamblee will study how shared, autonomous vehicles — think a self-driving Uber or Lyft — and other autonomous and connected technologies may shape the future of the city.

Developers...
Chamblee, US is preparing

Policy and Planning Priorities:
Land Use and Transit Planning, Pilot Zone Identification

In 2017, Chamblee, Ga. (pop: 20,000) began exploring the possibility of a shared autonomous vehicle pilot to provide first-last mile connections at the city’s MARTA rail station. The $400,000 study is being conducted by Stanen, an engineering firm, whose Urban Studio is engaged in several AV projects throughout North America. A draft of the completed feasibility study, which involved community group discussions and an online survey was adopted by city council in March 2018, and proposes a number of possible driverless shuttle routes serving the city’s main thoroughfares of Peachtree Road, including employers such as the Center for Disease Control, Internal Revenue Service, and the Peachtree-DeKalb Airport. Key findings include an estimated operating cost of $43,000 to $44,000 per month per vehicle, some 70 percent less than conventional human-driven, full-size buses on the same routes.
In 2017, Chamblee, Ga. (pop: 23,600) began exploring the possibility of a shared autonomous vehicle pilot to provide first/last mile connections at the city’s MARTA rail station. The $40,000 study is being conducted by SRAI, an engineering firm whose Urban Studio is engaged in several AV projects throughout North America. A draft of the completed feasibility study, which involved community group discussions and an online survey was adopted by city council in March 2019 and proposes a number of possible driverless shuttle routes serving the city’s main thoroughfare of Peachtree Road, including employers such as the Center for Disease Control, Internal Revenue Service, and the Peachtree-DeKalb Airport. Key findings include an estimated operating cost of $12,000 to $24,000 per month per vehicle, some 70 percent less than conventional human-driven, full-size buses on the same routes.

Driverless shuttles could be coming to DeKalb County city

By: Rob Deubter
Updated: Mar 18, 2019 - 8:47 PM

Chamblee is one of four other areas Georgia wins a grant from Georgia Tech’s Smart Communities Challenge. Chamblee will study new shared, autonomous vehicles — think ride-sharing Uber or Lyft — and other autonomous and connected technologies to help shape the future of the city's transportation system.
Chamblee, US is preparing

Policy and Planning Priorities:
Land Use and Transit Planning, Pilot Zone Identification

Chamblee, Ga. (page 32) began exploring the possibility of a shared autonomous vehicle pilot to provide first-last mile connections at the city’s MARTA rail station. The $40,000 study is being conducted by Scharret, an engineering firm, whose Urban Studio is engaged in several AV projects throughout North America. A draft of the completed feasibility study, which involved community group discussions and an online survey was adopted by city council in March 2023, and proposes a number of possible driverless shuttle routes serving the city’s main thoroughfare of Peachtree Road, including employers such as the Center for Disease Control, Internal Revenue Service, and the Peachtree-DeKalb Airport.

Chamblee is one of four cities across Georgia to win a grant from Georgia Tech’s Smart Community Challenge. Chamblee will study new shared, autonomous vehicles – think: self-driving Uber or Lyft – and how autonomous and connected technologies may shape the future of transportation in DeKalb County.

Driverless shuttles could be coming to DeKalb County city

By: Risa Dauhoo
Updated: May 18, 2023, 9:47 PM
Chamblee, US is preparing

Chamblee is one of four cities across Georgia that will receive a grant from Georgia Tech's Smart Cities Challenge. Chamblee will study new shared, autonomous vehicles - think a mix of Uber or Lyft and self-driving cars. The grant is intended to help cities explore how the technologies may shape the future of transportation in their area.
Would metro commuters ride a self-driving shuttle?

March 15 - Mar. 15 - Shuttles without a driver behind the wheel could be rolling onto a busy DeKalb County corridor.

At a meeting next Tuesday, Chamblee City Council is set to vote on a resolution to apply for a grant from the U.S. Department of Transportation that would fund a set of self-driving shuttles.

The city has looked into the possibility of autonomous shuttles, which would take riders up and down Peachtree Road, since 2017. The idea of an autonomous shuttle for丨来说, Chick-fil-A’s...
Grant Schedule

SAV Implementation Schedule

- Project Award
- Kickoff
- Project Management Plan
- Data Management Plan
- Project Evaluation Plan
- Contracts Finalized
- Data Analysis
- Shuttle 2 Deployed on Test Track
- Continued Testing
- Shuttles 2 & 3 Vehicles Deployed in Mixed Traffic
- Next phase Rd Construction
- Annual Budget Review
- Shuttle Runs in Mixed Traffic
- Quarterly Meeting
Smart Communities Q&A Panel

- Debra Lam, Georgia Tech - Debra.Lam@ipat.gatech.edu
- Tom Sever, Gwinnett County DOT - Tom.Sever@gwinnettcounty.com
- Rebecca Keefer, City of Chamblee - RKeefe@chambleega.gov
- Amy Goodwin, ARC (moderator) - Agoodwin@atlantaregional.org